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**UPPER GENITAL TRACT INFECTION**

**Objectives:**

Definition of PID and pathogenesis..1

.Discuss the commonest signs and symptoms.2

3. Approach to reach the diagnosis and treatment.

4. Discuss the commonest complications of PID.

**Pelvic Inflammatory disease:**

 **Definition:**it is the infection of upper genital tract. The exact prevalence is hard to ascertain as many cases may go under detected, but is thought to be 1-3% of sexual active women .It is a major cause of morbidity in young women.

 It is commonly occurs when there is ascending infection from the endocervix to the higher reproductive tract. Pelvic infection is common and usually results from sexually transmitted pathogens ascending from the lower to upper genital tract. Infection can also occur following pelvic surgery, in the puerperium and after instrumenting the uterus.it may occur from descending infection from organs such as the appendix. Although all reproductive tract organs may be involved, the organ of importance, with or without abscess formation, is the fallopian tube.

**Microbiology and Pathogenesis:**

The exact microbiologic pathogens in the fallopian tube cannotbe known for any given patient as transvaginalculture of the endocervix , endometrium, and cul-de-saccontents reveals different organisms from each site in the samepatient. For that reason, treatment protocols are designed so thatmost potential pathogens are covered by antibiotic regimens.

**Causes:**

 1-Upper tract infection is believed to be caused by bacteriathat ascend from the lower reproductive tract in 25% of cases. Classic salpingitis is associated with **N gonorrhoeae infection**, and **C trachomatis** is also commonlyrecovered. Another species frequently found is **T vaginalis**. The lower reproductive tract flora in women with PIDand in those with bacterial vaginosis is predominately **anaerobic species**. The microenvironment changes produced by BV mayaid ascension of the causative organisms of PID.

2-Other causes include [abortion](http://women.webmd.com/tc/abortion-topic-overview), [childbirth](http://www.webmd.com/baby/guide/delivery-methods) (because of raw placental site, breaks in the epithelial lining of the cervix and vagina, discharge of both liquor and lochia , degenerated blood clots and fragments of decidua offer a nidus for infection and pelvic procedures.

3-It is assumedthat this ascension is enhanced during menstruation due to loss of endocervical barriers. The gonococcus can cause a direct inflammatory response in the human endocervix, endometrium, and fallopian tube and is one of the true pathogens of human fallopian tube epithelial cells.

**4-** women with pulmonary tuberculosis can develop salpingitis and endometritis. The pathogen is thought to be blood-borne, but ascension may still be a possible route.

5-The fallopian tubes also can be infected by direct extension from inflammatory GI disease especially ruptured abscess, for example appendiceal or diverticular.

**When infection spreads upwards from the cervix (entrance to the uterus), it causes one or more of the followings:-**

- **Endometritis:** inflammation and infection of the endometrium.

- **Salpingitis:** inflammation and infection of the fallopian tubes.

- **Oophoritis:** inflammation and infection of the ovaries.

- **Salpingo-oophoritis**.

- **Parametritis**: inflammation and infection of the tissue around the uterus.-

 -**Tubo-ovarian abscess**: a pocket of infected fluid in the ovary and fallopian tube.-

-**Pelvic peritonitis**: inflammation and infection of the peritoneum (lining of the inside of the abdomen).

- **Perihepatits** ( Fitz-Hugh−Curtis syndrome ) .

**Incidence and mode of transmission:**

-Direct, lymphatic and haematogenous.

-Occur in 2% of sexually active women

**Risk Factors:**

**1**.Douching.

**2**.Substance abuse

**3**.Multiple sexual partners

4.Lower socioeconomic status

5.Recent new sexual partner(s)

6.Younger age (10 to 19 years)

7.Other sexually transmitted infections

8.Sexual partner with urethritis or gonorrhea.

9.Previous diagnosis of pelvic inflammatory disease

10.Not using mechanical and/or chemical contraceptive barriers

11.Endocervical testing positive for N gonorrhoeae or C trachomatis.

12**.** HSG.

13.IVF and IUI**.**

**Diagnosis:**

Pelvic inflammatory disease can be segregated into “silent” PID and PID. The latter can be further subdivided into acute and chronic.

**1. Silent PID :** is thought to follow multiple or continuous low-grade infection in asymptomatic women. Silent PID is not a clinical diagnosis. Rather, it is an ultimate diagnosis given to women with tubal- factor infertility that lacks a history compatible with upper tract infection. Many of these patients have antibodies to C trachomatis and/or N gonorrhoeae.

 At laparoscopy or laparotomy, affected women may have evidence of prior tubal infection such as adhesions, but or the most part, the fallopian tubes are grossly normal. Internally, however, tubes show fattened mucosal folds, and secretory epithelial cell degeneration. hydrosalpinx may be found. Grossly, these fallopian tubes are distended along their entire length. Their distal ends are dilated and clubbed, and fimbria are replaced by or encased by smooth adhesions. Sonographically, a hydrosalpinx tends to be anechoic, tubular, serpentine, and often with incomplete septa. The adhesions between the liver capsule and anterior abdominal wall may also reflect prior silent disease.

**2. Acute Pelvic Inflammatory Disease:** .

**The criteria for the Diagnosis of acute PID:**

**1-Essential features:**

At least one of which should be present to make the diagnosis of PID;

-Lower abdominal pain (usually bilateral).

**-** Adnexal tenderness.

- Cervical motion tenderness.

**2-Supporting features:**

-Intermenstrual/abnormal bleeding.

- Post-coital bleeding.

- Increased/abnormal vaginal discharge.

- Deep dyspareunia.

- Vaginal discharge.

- Fever.

- Nausea/vomiting.

- Right upper abdominal pain and tenderness.

- Generalized peritonitis. The diagnosis of PID is one typically based on clinical findings.

 **With acute PID, symptoms** characteristically develop during or soon following menstruation. These can include lower menstrual bleeding, fever, chills, anorexia, nausea, vomiting, diarrhea, dysmenorrhea, and dyspareunia. Patients also may have complaints suggesting urinary tract infection. Unfortunately, no single symptom is associated with a physical finding that is specific for this diagnosis. Accordingly, other possible sources of acute pelvic pain are considered.

Women with acute PID, leukorrhea or mucopurulent endocervicitis is common and is diagnosed visually and microscopically. During bimanual pelvic examination, affected women will usually have pelvic organ tenderness. Cervical motion tenderness (CM ) is typically elicited by quickly moving the cervix with examining vaginal fingers. This reflects pelvic peritonitis and can be considered a **vaginal “rebound” test**. If a woman has pelvic peritonitis secondary to bacteria and purulent debris that has exuded from the fimbriated end of the fallopian tube, this rapid peritoneal movement usually causes a marked pain response.

**Tapping the cul-de-sac** with examining finger(s) will give the examiner similar information. The latter maneuver usually causes a patient significantly less pain because less inflamed peritoneum is stretched.Abdominal peritonitis may be identified by deep probing and quick release of a hand placed on the abdomen—**a test for rebound.**

 Alternatively, an examining hand may be positioned with a palm against a woman’s mid abdomen and gently and quickly moved back and forth (shake). This can identify peritonitis, often with less patient discomfort.Inflammation of the liver capsule may lead to right upper quadrant pain, a condition known as Fitz-Hugh-Curtis syndrome ,classically, symptoms of this perihepatitis include sharp, pleuritic right upper quadrant pain that accompanies pelvic pain, the upper abdominal pain may refer to the shoulder or upper arm. With auscultation, a friction rub may be heard along right anterior costal margin. Importantly, during examination if all abdominal quadrants are involved, suspicion for a ruptured tuboovarian abscess ( OA) is heightened.

**Definitive diagnostic criteria:**

**1-WBC and CRP may be elevated.**

**2.Ultrasound** -documenting tubo-ovarian abscess

**3.Laparoscopy** – it is the gold standard test however it is invasive and only used where diagnosis is uncertain. Visually confirming salpingitis (tubal wall edema, and purulent exudate issuing from the fimbriated ends and pooling in the cul-de-sac confirm this diagnosis).

**4- Screening for other STI**- especially those with positive results for gonorrhoea and chlamydia or patient at high risk for STI :Microscopy and/or culture for Trichomonas vaginalis, HIV antibody test., Syphillis serology.

5-**Urine analysis and urine culture** to exclude UTI.

**3.Chronic Pelvic Inflammatory Disease** **:**

 The diagnosis is given to women who describe a history of acute PID and who have subsequent pelvic pain.

- **A hydrosalpinx** might qualify as a criterion for this diagnosis.

-**It is a histologic diagnosis** (chronic inflammation) made by a pathologist.

 **Treatment:** The primary goal of therapy is to eradicate bacteria, relieve symptoms, and prevent adverse sequelae.

**Complications of PID:**

**1.Tubal damage or occlusion** resulting from infection may lead to infertility. Rates following one episode approximate 15 %; two episodes, 35 %; and three or more episodes, 75 %

**2. Ectopic pregnancy** -6 to 10-fold and may reach a 10-percent risk for those who conceive.

**3. Chronic pelvic pain** (15 to 20 %).

**4. Recurrent infection** (20 to 25 %).

**5. Abscess formation** (5 to 15 %)**.**

**6.Intestinal adhesions and obstruction.**

**Guidelines for Treatment of Pelvic Inflammatory Disease:**

**Depending on the severity of the infection-**

1. **Outpatient Treatment( oral therapy) in mild –moderate infection:**

Outpatient treatment and inpatient therapy yield similar results, even for women with HIV infection and PID.

If women do not respond to oral therapy within 72 hours, re-evaluation is indicated and parenteral therapy should be initiated either as an inpatient or as an outpatient.

**Ceftriaxone,** 250 mg single intramuscularly injection Plus **Doxycycline,** 100 mg orally 2 times daily for 14 days **With or without Metronidazole**, 500 mg orally 2 times daily for 14 days.

1. **Inpatient Treatment(Parenteral Treatment):**

**Indications for hospitalization:**  recommended for parenteral treatment for at least 24 hours.

1.Pregnant

2.Adolescents

3.Drug addicts

4.Severe disease

5.Suspected abscess

6.Uncertain diagnosis

7.Generalized peritonitis

8.Temperature > 38.3°C

9.Failed outpatient therapy

10.Recent intrauterine instrumentation

11.White blood cell count > 15,000/mm3

12.Nausea/vomiting precluding oral therapy

13. Compliance with an outpatient regimen is in question.

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**Principles of treatment :**

**1.**Adequate supportive care.

**2.**Strict watch on fluid balance.

parenteral **Antibiotics :**

* **Ceftriaxone 2 g i.v. every 6 hours, or Cefotetan, 2 g i.v.every 12 hours, + doxycycline, 100 mg orally or intravenously every 12 hours, + i.v.metronidazole 500 mg twice daily.**

**Should be continued until the patient gets clinically better which is usually within 24 hours, then changed to oral therapy for 14 days.**

* **Surgical treatment:-**  Considered in :

1 -severe cases **not respond** to treatment.

2 -clear evidence of a **pelvic abscess** not resolved by antibiotic therapy.

**-Laparotomy/laparoscopy:**

**1.**early resolution of the disease by division of adhesions and drainage of pelvic abscess.

**2.** exclude other causes of pain like appendicitis, endometriosis, ovarian pathology- remove affected ovary.

**-** **U/S-guided** **aspiration** of pelvic fluid collections is less invasive and may be equally effective.

**-** Depending on age and reproductive history, **salpingo-oopherectomy** done for extensive damage.

**Complications of PID:**

**1.Recurrent pelvic inflammatory disease:**

The condition can return if the initial infection is not entirely cleared, often because **the course of antibiotics was not completed**, or because a **sexual partner has not been tested and treated**.

If an episode of PID damages the womb or fallopian tubes, it can become easier for bacteria to infect these areas in the future

**2.Tubo-ovarian Abscess:**

Is an end-stage process of acute PID, diagnosed when a patient with PID has a pelvic mass that is palpable during bimanual examination.

The condition usually reflects an agglutination of pelvic organs (tube, ovary, bowel) forming a palpable complex.

**Treatment** :with an antibiotic regimen administered in a hospital ,75% respond to antimicrobial therapy alone.

**Failure of medical therapy suggests the need for drainage of the abscess .** Although drainage may require surgical exploration, percutaneous drainage guided by imaging studies (ultrasound or computed tomography) should be used as an initial option if possible.

**salpingo -oophorectomy in severe damage.**

**3.Long-term pelvic pain:** you may be given painkillers to help control your symptoms .

**4.Ectopic pregnancy**: If PID infects the fallopian tubes,

**it can scar the lining of the tubes**, making it more difficult for eggs to pass through. If a fertilized egg gets stuck and begins to grow inside the tube.

**5.Infertility**

Blocked or damaged fallopian tubes can sometimes be treated with surgery, but if this is not possible ,you may want to consider an assisted conception technique such as [**in-vitro fertilisation (IVF)**](http://www.nhs.uk/conditions/ivf/Pages/Introduction.aspx)**.**